Request for Proposals: Commonwealth Information Technology Initiative

Background:

Information technology has become a major global enterprise that is growing exponentially in a dynamic and complex market place. The U.S. information technology industry leads the world producing 50% of worldwide IT revenues, a major portion of which is contributed by the Commonwealth. This explosive growth in the IT industry has been met head-on by a major challenge: the need for huge number of qualified employees at all levels, from trained technicians to skilled researchers. A review of the literature indicates an urgent need in the labor market for graduates with education and experience in information technology and information science. The Information Technology Association of America predicts that 1.6 million new jobs involving computer, Internet, and telecommunications expertise will be created in the next 12 months—and more than half are likely to go unfilled. Based on the fundamental changes currently transforming our information based economy, this demand for IT workforce is not expected to lessen any time soon, but it is projected to get worse unless corrective actions are taken soon.

Through a synergistic and multidisciplinary effort involving all the UMass campuses, 4-year and 2-year state colleges, a plan for a comprehensive program addressing the IT industry’s needs for educating and training people has been developed. This initiative has been recently funded by the Board of Higher Education (BHE) and is officially named as the Commonwealth Information Technology Initiative, (CITI). The goal of the CITI initiative is to enhance and strengthen the academic IT programs in “all” of public higher education (community colleges, state colleges, and universities). A copy of the proposal for the CITI initiative can be found at http://gaia.cs.umass.edu/kurose/citi_final.pdf.

Request for Proposals:

As a part of this program, we are requesting proposals for developing new courses in the broad area of “Information Technology.” The idea is to identify and develop new courses so that the existing IT degree offerings are enriched and/or help to initiate new IT offerings, if necessary, at the higher educational institutions of the Commonwealth. For example, an IT minor could be initiated at the UMass campuses which will provide an attractive option for a student, who is not majoring in either Computer Science or Computer Systems Engineering, to obtain a very good knowledge base in information technology. More information about the proposed IT minor can be found at www.umass.edu/itworkforce. Special consideration will be given to course proposals that are co-developed and co-taught between two or more educational institutions in the commonwealth.

A successful proposal should describe, in detail, the IT course that will be developed; it should also explain how this effort will fit into his/her Department or School’s long term plans, and its role in enhancing the exiting IT offerings and/or initiating a new IT offering. The proposed course must be offered as an experimental course in either the Spring 2001 or Fall 2001 semester. The proposal should identify funding required including faculty compensation, funding for adjunct teaching, and other needs. The budget for course development should not exceed ~ $30,000. No funding will be provided for equipment. The proposal should also include plans for disseminating the course to other institutions in the Commonwealth such as UMass campuses, community colleges and state schools.

A proposal, no longer than 3 pages, should be submitted by November 15, 2000 with a letter of support co-signed by the Department Head and the Dean of the College/School where the faculty member resides. Mail the proposals to BHE-CITI Program Administrator, C/O Provost Office.

The selection committee (appointed by the Provost) will announce the winning proposals by December 1, 2000 and the funds will be available by December 15, 2000.
Commonwealth Information Technology Initiative
(Funded by Board of Higher Education)

Some of the main points from the above proposal that are relevant to the RFP process:

The above proposal is led by the campuses of the University of Massachusetts and is a partnership with all Computer and Information Science and Technology (CIST) programs in the state (community colleges, four-year colleges and the University of Massachusetts) and industry. This comprehensive initiative has four key components aimed at addressing the workforce needs in the information technology area for the Commonwealth. Development of new information technology curriculum is one of the four key components of the initiative.

One of the major objectives of this initiative is to move the IT instruction beyond the traditional IT fields (Computer Science, Computer Systems Engineering and Management of Information Systems). This idea of making the IT field more open to students with different objectives, backgrounds is based on the notion that a reasonable amount of knowledge in IT will provide better opportunities for all the students, irrespective of their discipline, so that they can become productive members of the new IT based economy.

In other words, our system should be able to accommodate students who have different interests, educational and vocational objectives, levels of technical ability and preparedness, and levels of self-confidence in their path to an IT career.

In order to achieve this objective we need to identify and develop new courses so that the existing IT degree offerings are enriched and/or help to initiate new IT offerings, if necessary, at the higher educational institutions of the Commonwealth. For example, an IT minor could be initiated at the UMass campuses which will provide an attractive option for a student, who is not majoring in either Computer Science or Computer Systems Engineering, to obtain a very good knowledge base in information technology. We also need encourage both co-development and co-teaching of courses between the educational institutions in the Commonwealth.

Several new IT courses need to be developed to accomplish this goal. These courses can be broadly categorized into: (1) Core Courses, (2) Associate Degree Courses, (3) Undergraduate Degree Courses, (4) Graduate Courses, (5) Certificate Courses and (6) Distance Education Courses.

The IT-curriculum committee at the UMass-Amherst campus has taken a lead in identifying and developing some of the so-called “core-courses”. For more information about UMass-Amherst IT effort can be found at www.umass.edu/itworkforce. The core-courses that have been identified so far include:

1) **Introduction to Information Technology**

   Students will get a sense of what this subject is all about in order to make better-informed decisions about their studies and their career. The objectives of this course will include teaching students the concepts of modern computer information systems with an emphasis on the key concept of information and teaching the rudiments of modern electronic technology. This course will not only prepare the students technically so that they can succeed in other IT courses, but also show them how information technology can be applied to a wide range of problems in may fields of endeavor.

2) **Principles of Object Oriented Programming**

   The course will provide students with the necessary background in object-oriented design and programming. The students will be exposed to object oriented design strategies and language features & constructs that support the object environment. Upon completion of the course, students will be able to apply system development principles using an object-oriented language, show how object-oriented techniques increase productivity of complex systems.
3) **Representing, Storing and Retrieving Information**
This course will provide an introduction to the representation, storage, retrieval, manipulation, analysis and display of information. This course includes an introduction to data structures, design principles of databases, database models and database management systems, architectures, database analysis and design, and database administration. Topics such as heterogeneous collection of data and effectiveness of various search engines will also be included.

*Prof. Barrington (Comp. Sci) is taking the lead in developing this course.*

4) **Introduction to Internet Technology**
The objective of the course is to develop a familiarity with the concepts, vocabulary and tools of Internet Technology as well as enhance students’ written and oral presentation skills.

*Prof. Ganz (ECE) has developed this course and is offering now (Fall-00).*

5) **Multimedia Systems**
This course introduces students to the systems issues in multimedia, providing a unified view of the way that multimedia applications are implemented as well as specific details on the design of various multimedia system components. Students will use various web-based tools to learn the various engineering issues in multimedia (e.g. network performance, compression algorithms, errors). The course will present simple intuitive explanations of multimedia systems, avoiding the advanced mathematics required for a thorough understanding, but providing sufficient depth to understand the multimedia issues in larger IT systems.

*Prof. Burleson (ECE) is currently developing this course and will be offered in Spring-01.*

6) **Political and Social Impact of Information Technology**
This course discusses issues such as free speech versus censorship, privacy, ethics, intellectual property, cyber-crimes versus security, liability, safety and electronic government.

7) **The Political Economy of Information Technology**
The course deals with the various political and economic theories related to IT. Issues such as information transport, information content, information markets, electronic markets, government intervention, electronic communities and changing urban economies. In addition to examining the macro indicators and trends, the course will also examine the microeconomics and politics of specific arenas such as software industry, tele-medicine.

8) **Management of Information Technology in Organizations**
This course deals with the issues of information technology management in public and nonprofit organization. Topics include, information management concepts, organizational applications and issues, and strategic planning of IT.

In addition to the courses listed above, we need to identify and develop several other courses so that a student obtains the most up-dated learning experience in technical, social, political, business and psychological aspects of information technology.